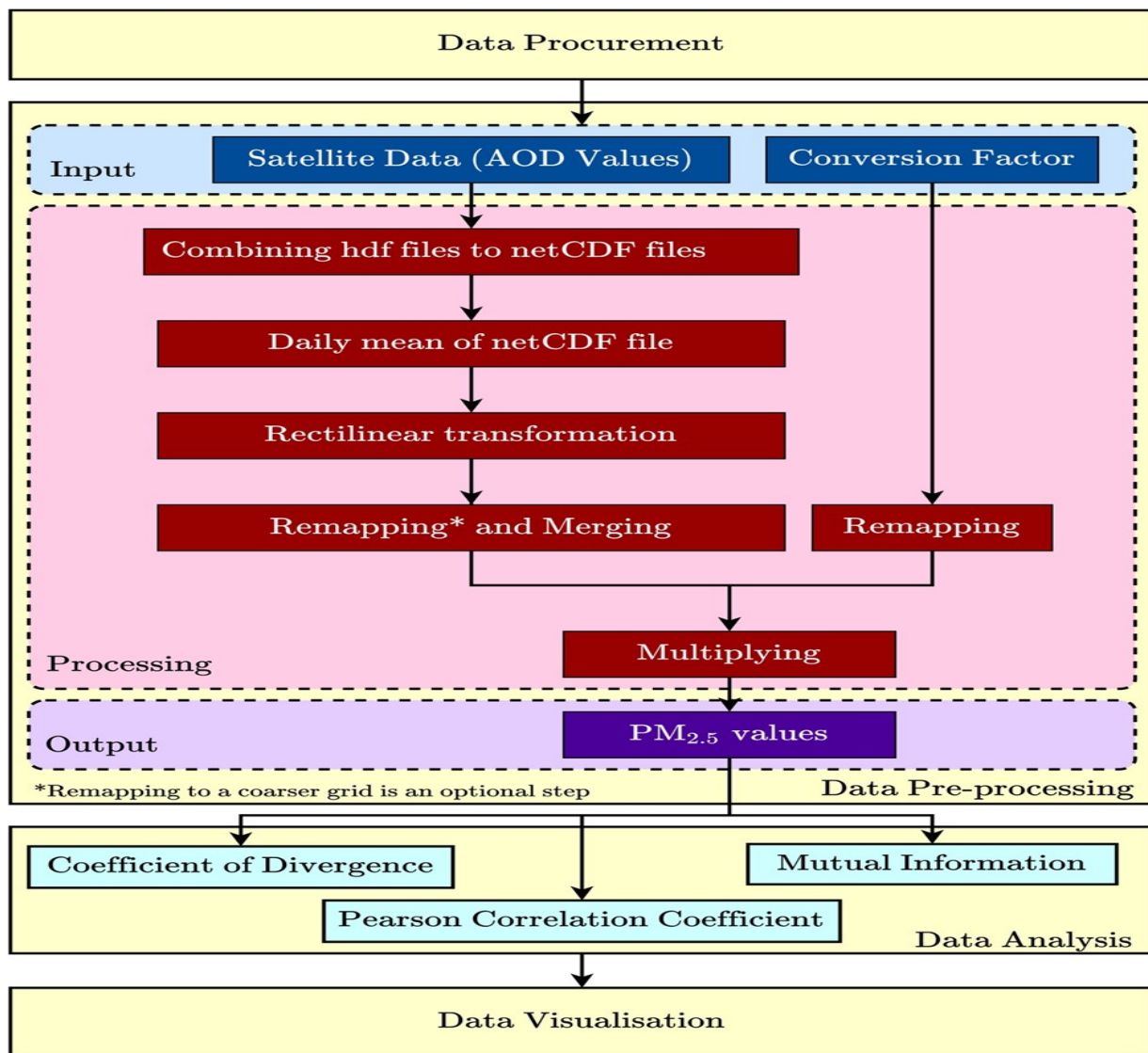


Identifying regionally representative sites using satellite data - Methodology

Nirav Lekinwala ,Ankur Bhardwaj,Ramya Sunder Raman, Mani Bhushan, Kunal Bali ,Sagnik Dey.



Key highlights:

- Discusses the processing of satellite data used in site-selection methodology discussed in Lekinwala et. al., (2020).
- High-resolution AOD data obtained from NASA's Aqua and Terra satellite using MA-IAC algorithm is used.
- AOD data is converted to PM_{2.5} using GEOS-Chem Chemical Transport Model.
- Tools like CDO, NCL and in-house Python codes are used for processing.

- Statistical metrics like Pearson Correlation Coefficient, Coefficient of Divergence and Mutual Information are used to quantify and extract useful information from it.

Summary:

The focus of the work is satellite data-based analysis for the identification of regionally representative sites using a weight-of-evidence approach. The different steps involved for the same

are discussed in detail for processing the satellite data using NCL and CDO, computing different metrics used along with a Python code for the same. Along with the metrics like the Coefficient of Divergence (CoD) and Pearson Correlation Coefficient (PCC)

used in literature, this work also proposes the use of Mutual information (MI) as a metric to capture the non-linear relationship in the data. To facilitate better interpretation and comparison, all the above methods are visualised on a spatial map.

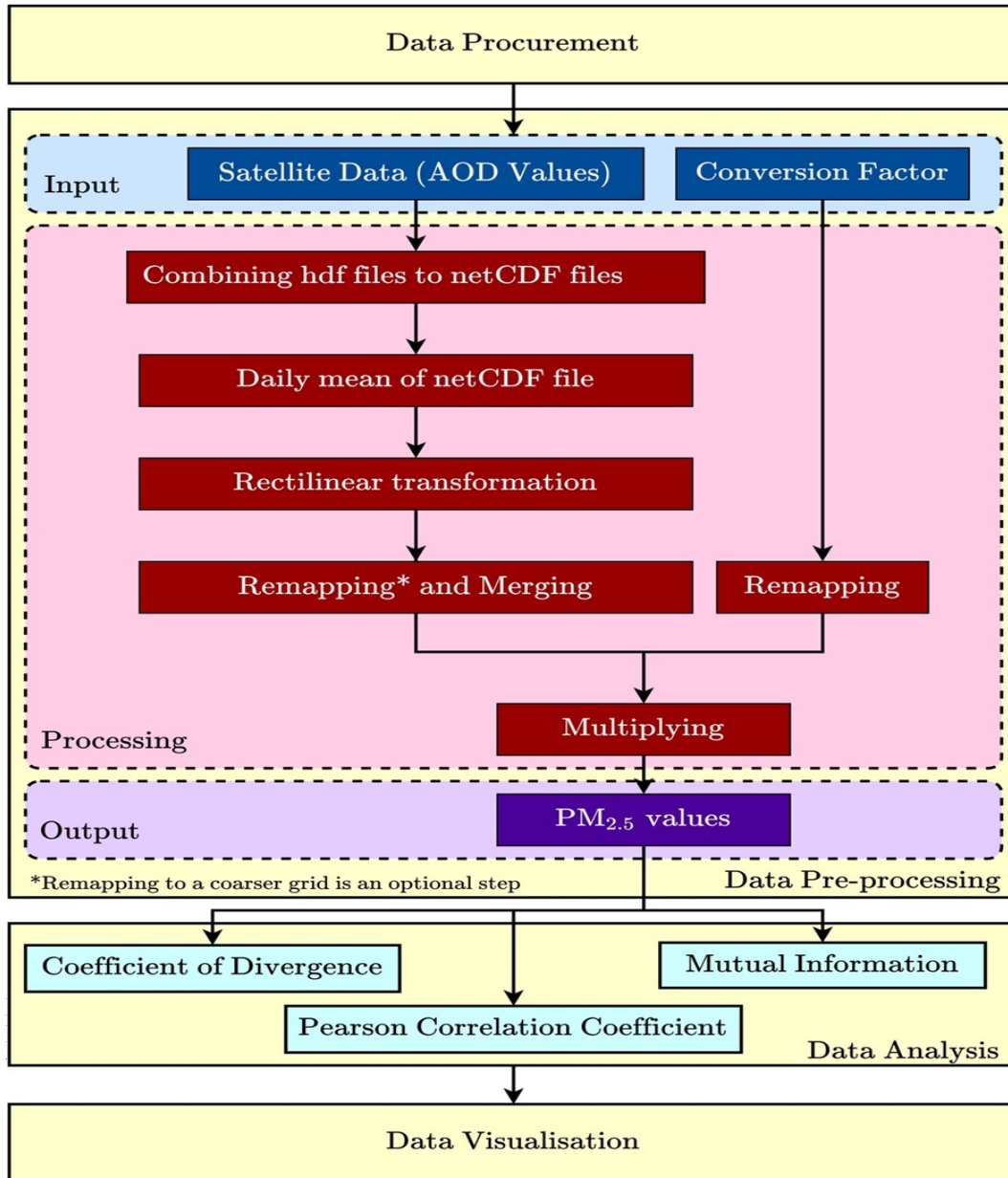


Figure 1: CoD, PCC and MI metrics showing regional representativeness of a potential site at Bhopal.

Major findings :

- Development of an approach for analysing satellite data for site identification application.
- Proposing the use of Mutual Information as an additional metric along with the Coefficient of Divergence and Pearson Correlation Coefficient.

Research Article

Citation

Lekinwala, N. L., Bharadwaj, A., Raman, R. S., Bhushan, M., Bali, K., & Dey, S. (2020). Weight-of-evidence approach to identify regionally representative sites for air-quality monitoring network: Satellite data-based analysis. *MethodsX*, 7, 100949.

Link: <https://doi.org/10.1016/j.mex.2020.100949>

Contact

Prof. Chandra Venkataraman
National Co-ordinator

(NCAP-COALESCCE Project)
Interdisciplinary Programme in
Climate Studies

Indian Institute of Technology,
Bombay Powai, Mumbai-
400076, India

Phone: 91-22-2576-5141

<https://ncapcoalesce.iitb.ac.in/>

Consortium partners in the NCAP-COALESCCE network

